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What is claimed is:

*Sub B1*  
 1. A process for the preparation of a malted cereal comprising the step of introducing an activated spore before or during a malting process.

2. The process according to Claim 1, wherein said activated spore increases an activity of an enzyme during said malting process.

3. The process according to Claim 1 or Claim 2, wherein said enzyme is selected from the group of  $\beta$ -glucanase, xylanase, amylase, a protease, naturally occurring enzymes in the cereal and combinations thereof.

*Sub B2*  
 4. A process for the preparation of a malted cereal as recited in claim 2 wherein the cereal, water and activated spores are combined to form a combination and where the concentration of the activated spores and the combination is held together for a time and temperature which are effective for providing the malted cereal with an enzyme activity which is greater than the enzyme activity which is obtained by a matter process without activated spores.

5. A process as recited in claim 4 wherein the combination is held for a time and temperature until the cereal has a moisture content of at least about 20 weight percent.

6. A process as recited in claims 4 or 5 wherein the combination is held until the cereal germinates and after germination, cereal is dried to a moisture content of not more than about 15 weight percent.

*Sub B3*  
 7. A process as recited in claim 6 wherein the combination is held until the cereal has a moisture content of between about 20 to about 60 weight percent

*sub B3 >*

and has germinated for about 2 to about 7 days at a temperature of from about 10 to about 30°C.

8. A process as recited in claim 6 wherein the combination is held until the cereal has a moisture content of between about 20 to about 60 weight percent and has germinated for about 2 to about 7 days at a temperature of from about 10 to about 30°C. and is dried to a moisture content of from about 2 to about 15 weight percent.

*claim 1 or 4*

9. A process as recited in claims 1, 2 or 4 wherein the activated spores are from the microbes selected from the group comprising of Micrococcus spp., Streptococcus spp., Leuconostoc spp., Pediococcus spp., Pediococcus halophilus, Pediococcus cerevisiae, Pediococcus damnosus, Pediococcus hemophilus, Pediococcus parvulus, Pediococcus soyae, Lactococcus spp., Lactobacillus spp., Lactobacillus acidophilus, Lactobacillus amylovorus, Lactobacillus bavaricus, Lactobacillus bifementans, Lactobacillus brevis var lindneri, Lactobacillus casei var casei, Lactobacillus delbrueckii, Lactobacillus delbrueckii var lactis, Lactobacillus delbrueckii var bulgaricus, Lactobacillus fermenti, Lactobacillus gasseri, Lactobacillus helveticus, Lactobacillus hilgardii, Lactobacillus reuteri, Lactobacillus sake, Lactobacillus sativarius, Lactobacillus cremoris, Lactobacillus kefir, Lactobacillus pentoceticus, Lactobacillus cellobiosus, Lactobacillus bruxellensis, Lactobacillus buchneri, Lactobacillus coryneformis, Lactobacillus confusus, Lactobacillus florentinus, Lactobacillus viridescens, Corynebacterium spp., Propionibacterium spp., Bifidobacterium spp., Streptomyces spp., Bacillus spp., Sporolactobacillus spp., Acetobacter spp., Agrobacterium spp., Alcaligenes spp., Pseudomonas spp., Pseudomonas amylophilus, Pseudomonas aeruginosa, Pseudomonas corynephila, Pseudomonas mexicana, Pseudomonas pseudomall 1, Glucon bacter spp., Enterobacter spp., Erwinia spp., Klebsiella spp., Proteus spp., Ascomycota,

**Dothideales, Mycosphaerellaceae, Mycosphaerella spp., Venturiaceae, Venturia spp., Eurotiales, Monascaceae, Monascus spp., Trichocomaceae, Emericella spp., Euroteum spp., Eupenicillium spp., Neosartorya spp., Talaromyces spp., Hypocreales, Hypocreaceae, Hypocrea spp., Saccharomycetales, Dipodascaceae, Dipodascus spp., Galactomyces spp., Endomycetaceae, Endomyces spp., Metschnikowiaceae, Guilliermondella spp., Saccharomycetaceae, Debaryomyces spp., Dekkera spp., Pichia spp., Kluyveromyces spp., Saccharomyces spp., Torulaspora spp., Zygosaccharomyces spp., Saccharomycodaceae, Hanseniaspora spp.; Schizosaccharomycetales, Schizosaccharomycetaceae, Schizosaccharomyces spp., Sordariales, Chaetomiaceae, Chaetomium spp., Sordariacea, Neurospora spp., Zygomycota, Mucorales, Mucoraceae, Absidia spp., Amylomyces spp., Rhizomucor spp., Actinomucor spp., Thermomucor spp., Chlamydomyces spp., Mucor spp., Mucor circinelloides, Mucor griseicyanus, Mucor hiemalis, Mucor indicus, Mucor mucedo, Mucor piriformis, Mucor plumbeus, Mucor praini, Mucor pusillus, Mucor sylvaticus, Mucor javanicus, Mucor racemosus, Mucor rouxianus, Mucor rouxii, Mucor aromaticus, Mucor flavus, Mucor miehei, Rhizopus spp., Rhizopus arrhizus, Rhizopus oligosporus, Rhizopus oryzae, Rhizopus oryzae strain ATCC 4858, Rhizopus oryzae strain ATCC 9363, Rhizopus oryzae strain NRRL 1891, Rhizopus oryzae strain NRRL 1472, Rhizopus stolonifer, Rhizopus thailandensis, Rhizopus formosaensis, Rhizopus chinensis, Rhizopus cohnii, Rhizopus japonicus, Rhizopus nodosus, Rhizopus delemar, Rhizopus acitorinus, Rhizopus chlamydosporus, Rhizopus circinans, Rhizopus javanicus, Rhizopus peka, Rhizopus saitoi, Rhizopus tritici, Rhizopus niveus, Rhizopus microsporus, Mitosporic fungi, Aureobasidium spp., Acremonium spp., Cercospora spp., Epicoccum spp., Monilia spp., Monilia candida, Monilia sitophila, Mycoderma spp., Candida spp., Candida diddensiae, Candida edax, Candida etchellsii, Candida kefir, Candida kriesel, Candida lactosa, Candida lambica, Candida melinii, Candida utilis, Candida milleri, Candida mycoderma, Candida parapsilosis, Candida obtusa, Candida tropicalis, Candida**

valida, Candida versatilis, Candida guilliermondii, Rhodotorula spp., Torulopsis spp., Geotrichum spp., Geotrichum amycelum, Geotrichum armillariae, Geotrichum asteroides, Geotrichum bipunctatum, Geotrichum dulcitum, Geotrichum eriense, Geotrichum fici, Geotrichum flavo-brunneum, Geotrichum fragrans, Geotrichum gracile, Geotrichum heritum, Geotrichum kieberkni, Geotrichum penicillatum, Geotrichum hirtum, Geotrichum pseudocandidum, Geotrichum rectangulatum, Geotrichum suaveolens, Geotrichum vannya, Geotrichum loubieri, Geotrichum microsporum, Cladosporium spp., Trichoderma spp., Trichoderma hamatum, Trichoderma harzianum, Trichoderma koningii, Trichoderma pseudokoningii, Trichoderma reesei, Trichoderma virgatum, Trichoderma viride, Oldium spp., Alternaria spp., Alternaria alternata, Alternaria tenuis, Helminthosporum spp., Helminthosporum gramineum, Helminthosporum sativum, Helminthosporum teres, Aspergillus spp., Aspergillus ochraceus, Aspergillus nidulans, Aspergillus versicolor, Aspergillus wentii Group, Aspergillus candidus, Aspergillus flavus, Aspergillus niger, Aspergillus oryza strain ATCC 14156, Penicillium spp., Penicillium aculeatum, Penicillium citrinum, Penicillium claviforme, Penicillium funiculosum, Penicillium italicum, Penicillium lanoso-viride, Penicillium emersonii, Penicillium illacinum, Penicillium expansum and mixtures thereof.

10. A malted cereal product made according to the process of claims 1 through 9.

11. An aqueous combination of a cereal and activated spores.

12. A process as recited in claim 11 wherein the activated spores are from the microbes selected from the group comprising Micrococcus spp., Streptococcus spp., Leuconostoc spp., Pediococcus spp., Pediococcus halophilus, Pediococcus cerevisiae, Pediococcus damnosus, Pediococcus

*hemophilus*, *Pediococcus parvulus*, *Pediococcus soyae*, *Lactococcus spp.*, *Lactobacillus spp.*, *Lactobacillus acidophilus*, *Lactobacillus amylovorus*, *Lactobacillus bavanicus*, *Lactobacillus bifementans*, *Lactobacillus brevis* var *lindneri*, *Lactobacillus casei* var *casei*, *Lactobacillus delbrueckii*, *Lactobacillus delbrueckii* var *lactis*, *Lactobacillus delbrueckii* var *bulgaricus*, *Lactobacillus fermenti*, *Lactobacillus gasseri*, *Lactobacillus helveticus*, *Lactobacillus hilgardii*, *Lactobacillus reuteri*, *Lactobacillus sake*, *Lactobacillus sativarius*, *Lactobacillus cremoris*, *Lactobacillus kefir*, *Lactobacillus pentoceticus*, *Lactobacillus cellobiosus*, *Lactobacillus bruxellensis*, *Lactobacillus buchneri*, *Lactobacillus coryneformis*, *Lactobacillus confusus*, *Lactobacillus florentinus*, *Lactobacillus viridescens*, *Corynebacterium spp.*, *Propionibacterium spp.*, *Bifidobacterium spp.*, *Streptomyces spp.*, *Bacillus spp.*, *Sporolactobacillus spp.*, *Acetobacter spp.*, *Agrobacterium spp.*, *Alcaligenes spp.*, *Pseudomonas spp.*, *Pseudomonas amylophilia*, *Pseudomonas aeruginosa*, *Pseudomonas cocovenenans*, *Pseudomonas mexicana*, *Pseudomonas pseudomallei*, *Gluconohacter spp.*, *Enterobacter spp.*, *Erwinia spp.*, *Klebsiella spp.*, *Proteus spp.*, *Ascomycota*, *Dothideales*, *Mycosphaerellaceae*, *Mycosphaerella spp.*, *Venturiaceae*, *Venturia spp.*, *Eurotiales*, *Monascaceae*, *Monascus spp.*, *Trichocomaceae*, *Emericilla spp.*, *Euroteum spp.*, *Eupenicillium spp.*, *Neosartorya spp.*, *Talaromyces spp.*, *Hypocreales*, *Hypocreaceae*, *Hypocrea spp.*, *Saccharomycetales*, *Dipodascaceae*, *Dipodascus spp.*, *Galactomyces spp.*, *Endomycetaceae*, *Endomyces spp.*, *Metschnikowiacae*, *Gillihermondella spp.*, *Saccharomycetaceae*, *Debaryomyces spp.*, *Dekkera spp.*, *Pichia spp.*, *Kluyveromyces spp.*, *Saccharomyces spp.*, *Torulaspora spp.*, *Zygosaccharomyces spp.*, *Saccharomycodaceae*, *Hanseniaspora spp.*; *Schizosaccharomycetales*, *Schizosaccharomycetaceae*, *Schizosaccharomyces spp.*, *Sordariales*, *Chaetomiaceae*, *Chaetomium spp.*, *Sordariaceae*, *Neurospora spp.*, *Zygomycota*, *Mucorales*, *Mucoraceae*, *Absidia spp.*, *Amyleomyces spp.*, *Rhizomucor spp.*, *Actinomucor spp.*, *Thermomucor spp.*, *Chlamydomucor spp.*, *Mucor spp.*, *Mucor circinelloides*, *Mucor griseoceanus*.

*Mucor hiemalis*, *Mucor indicus*, *Mucor mucedo*, *Mucor piformis*, *Mucor plumbeus*, *Mucor praini*, *Mucor pusillus*, *Mucor sylvaticus*, *Mucor javanicus*, *Mucor racemosus*, *Mucor rouxianus*, *Mucor rouxi*, *Mucor aromaticus*, *Mucor flavus*, *Mucor miehei*, *Rhizopus spp.*, *Rhizopus arrhizus*, *Rhizopus oligosporus*, *Rhizopus oryzae*, *Rhizopus oryzae* strain ATCC 4858, *Rhizopus oryzae* strain ATCC 9363, *Rhizopus oryzae* strain NRRL 1891, *Rhizopus oryzae* strain NRRL 1472, *Rhizopus stolonifer*, *Rhizopus thailandensis*, *Rhizopus formosensis*, *Rhizopus chinensis*, *Rhizopus cohnii*, *Rhizopus japonicus*, *Rhizopus nodosus*, *Rhizopus delemat*, *Rhizopus acitorinus*, *Rhizopus chlamydosporus*, *Rhizopus circinans*, *Rhizopus javanicus*, *Rhizopus peka*, *Rhizopus salto*, *Rhizopus tritici*, *Rhizopus niveus*, *Rhizopus microsporus*, *Mitosporic fungi*, *Aureobasidium spp.*, *Acremonium spp.*, *Cercospora spp.*, *Epicoccum spp.*, *Monilia spp.*, *Monilia candida*, *Monilia sitophila*, *Mycoderma spp.*, *Candida spp.*, *Candida diddensiae*, *Candida edax*, *Candida etchellsii*, *Candida kefir*, *Candida krusei*, *Candida lactosa*, *Candida lambica*, *Candida mellini*, *Candida utilis*, *Candida milleri*, *Candida mycoderma*, *Candida parapsilosis*, *Candida obtux*, *Candida tropicalis*, *Candida valida*, *Candida versatilis*, *Candida guilliermondii*, *Rhodotorula spp.*, *Torulopsis spp.*, *Geotrichum spp.*, *Geotrichum amycelium*, *Geotrichum armillariae*, *Geotrichum asteroides*, *Geotrichum bipunctatum*, *Geotrichum dulcicum*, *Geotrichum eriense*, *Geotrichum fici*, *Geotrichum flavo-brunneum*, *Geotrichum fragrans*, *Geotrichum gracile*, *Geotrichum heritum*, *Geotrichum klebaki*, *Geotrichum penicillatum*, *Geotrichum hirtum*, *Geotrichum pseudocandidum*, *Geotrichum rectangulatum*, *Geotrichum suaveolens*, *Geotrichum vanryia*, *Geotrichum loubieri*, *Geotrichum microsporum*, *Cladosporium spp.*, *Trichoderma spp.*, *Trichoderma hamatum*, *Trichoderma harzianum*, *Trichoderma koningii*, *Trichoderma pseudokoningii*, *Trichoderma reesei*, *Trichoderma virgatum*, *Trichoderma virid*, *Oidium spp.*, *Alternaria spp.*, *Alternaria alternata*, *Alternaria tenuis*, *Helminthosporium spp.*, *Helminthosporium gramineum*, *Helminthosporium sativum*, *Helminthosporium teres*, *Aspergillus spp.*, *Aspergillus*

ochraceus, Aspergillus nidulans, Aspergillus versicolor, Aspergillus wentii Group, Aspergillus candidus, Aspergillus flavus, Aspergillus niger, Aspergillus oryzae strain ATCC 14156, Penicillium spp., Penicillium aculeatum, Penicillium citrinum, Penicillium claviforme, Penicillium funiculosum, Penicillium italicum, Penicillium lanoso-viride, Penicillium emersonii, Penicillium illudum, Penicillium expansum and mixtures thereof.

Sub C25  
13. A process for the preparation of a malted cereal said process comprising the steps of:

- (a) introducing an activated spore into a moistened cereal to provide an inoculated moistened cereal to form a moistened cereal/activated spore combination;
- (b) germinating said inoculated moistened cereal; and
- (c) drying said germinated cereal.

14. The process according to Claim 13, wherein said inoculated moistened cereal is held at a temperature of from about 5° to about 30°C until the cereal has a moisture content of from about 20 to about 60 weight percent moisture.

15. The process according to Claim 13 or Claim 14, wherein said germinating step (b) is carried out for about 3 to about 6 days at a temperature of from about 10° to about 30°C.

16. The process according to any one of Claims 13 to 15, wherein said germinated cereal is dried to a moisture content of from about 2 to about 15 weight percent.

or 14

17. A process as recited in claim 13 wherein the combination is held at a temperature of from about 10°C to about 20°C until the cereal has a moisture content of from about 38 to about 47 weight percent and the cereal has germinated for about 3 to about 6 days at a temperature of from about 14°C to about 18°C and the germinated cereal is dried at a temperature of from about 40°C to about 150°C.

Sub C3

18. A process for the preparation of a malted cereal said process comprising the step of moistening a cereal and activated spores wherein the concentration of the activated spores, moistening time and moistening temperature are effective for providing the malted cereal with an increase in activity of an enzyme compared to the activity of an enzyme obtained by moistening the cereal without activated spores.

19. The process according to Claim 18, wherein said enzyme is selected from the group of  $\beta$ -glucanase, xylanase, amylase, protease, naturally occurring enzymes in the cereal and combinations thereof.

Sub C4

20. A process as recited in claim 18 wherein the cereal moistening time and temperature are effective to provide the cereal with a moisture content of at least about 20 weight percent.

21. A process as recited in claim 20 wherein after cereal attains a moisture content of at least about 20 weight percent, it is dried to a moisture content of not more than about 15 weight percent.

Sub C5

22. A process as recited in claims 18, 19, 20 or 21 wherein the moistening time and temperature are effective to provide the cereal with a moisture content of between about 20 to about 60 weight percent and wherein the cereal has

Sub C5>

germinated for about 2 to about 7 days at a temperature of from about 10 to about 30°C.

23. A process as recited in claim 22 wherein the germinated is dried to a moisture content of from about 2 to about 15 weight percent.

24. A process as recited in claim 23 wherein the activated spores are from the microbes selected from the group comprising *Micrococcus* spp., *Streptococcus* spp., *Leuconostoc* spp., *Pediococcus* spp., *Pediococcus halophilus*, *Pediococcus cerevisiae*, *Pediococcus damnosus*, *Pediococcus hemophilus*, *Pediococcus parvulus*, *Pediococcus soyae*, *Lactococcus* spp., *Lactobacillus* spp., *Lactobacillus acidophilus*, *Lactobacillus amylovorus*, *Lactobacillus bavaricus*, *Lactobacillus bifementans*, *Lactobacillus brevis* var *lindneri*, *Lactobacillus casei* var *casei*, *Lactobacillus delbrueckii*, *Lactobacillus delbrueckii* var *lactis*, *Lactobacillus delbrueckii* var *bulgaricus*, *Lactobacillus fermenti*, *Lactobacillus gasseri*, *Lactobacillus helveticus*, *Lactobacillus hilgardii*, *Lactobacillus reuteri*, *Lactobacillus sake*, *Lactobacillus sativarius*, *Lactobacillus cremoris*, *Lactobacillus kefir*, *Lactobacillus pentoceticus*, *Lactobacillus cellobiosus*, *Lactobacillus bruxellensis*, *Lactobacillus buchneri*, *Lactobacillus coryneformis*, *Lactobacillus confusus*, *Lactobacillus florentinus*, *Lactobacillus viridescens*, *Corynebacterium* spp., *Propionibacterium* spp., *Bifidobacterium* spp., *Streptomyces* spp., *Bacillus* spp., *Sporolactobacillus* spp., *Acetobacter* spp., *Agrobacterium* spp., *Alcaligenes* spp., *Pseudomonas* spp., *Pseudomonas amylophilia*, *Pseudomonas aeruginosa*, *Pseudomonas coryneformans*, *Pseudomonas mexicana*, *Pseudomonas pseudomallei*, *Gluconobacter* spp., *Enterobacter* spp., *Erwinia* spp., *Klebsiella* spp., *Proteus* spp., *Ascomycota*, *Dothideal* s, *Mycosphaerellaceae*, *Mycosphaerella* spp., *V nturiaceae*, *Venturia* spp., *Eurotiales*, *Monascaceae*, *Monascus* spp., *Trichocomaceae*, *Emericella* spp., *Euroteum* spp., *Eupenicillium* spp., *Neosartorya* spp., *Talaromyces* spp.,

Hypocreales, Hypocreaceae, *Hypocrea* spp., Saccharomycetales, Dipodascaceae,  
*Dipodascus* spp., Galactomyces spp., Endomycetaceae, Endomyces spp.,  
Metschnikowiaeae, *Guilliermondella* spp., Saccharomycetaceae, Debaryomyces  
spp., Dekkera spp., Pichia spp., Kluyveromyces spp., *Saccharomyces* spp.,  
*Torulaspora* spp., Zygosaccharomyces spp., Saccharomycodaceae,  
*Hanseniaspora* spp.; Schizosaccharomycetales, Schizosaccharomycetaceae,  
*Schizosaccharomyces* spp., Sordariales, Chaetomiaceae, *Chaetomium* spp.,  
Sordariacea, Neurospora spp., Zygomycota, Mucorales, Mucoraceae, Absidia  
spp., Amylomyces spp., Rhizomucor spp., Actinomucor spp., Thermo-mucor spp.,  
Chlamydomucor spp., *Mucor* spp., *Mucor circinelloides*, *Mucor griseicyanus*,  
*Mucor hiemalis*, *Mucor indicus*, *Mucor mucedo*, *Mucor piriformis*, *Mucor*  
*plumbeus*, *Mucor praini*, *Mucor pusillus*, *Mucor sylvaticus*, *Mucor javanicus*,  
*Mucor racemosus*, *Mucor rouxianus*, *Mucor rouxii*, *Mucor aromaticus*, *Mucor*  
*flavus*, *Mucor miehei*, Rhizopus spp., Rhizopus arrhizus, Rhizopus oligosporus,  
Rhizopus oryzae, Rhizopus oryzae strain ATCC 4858, Rhizopus oryzae strain  
ATCC 9363, Rhizopus oryzae strain NRRL 1891, Rhizopus oryzae strain NRRL  
1472, Rhizopus stolonifer, Rhizopus thailandensis, Rhizopus formosensis,  
Rhizopus chinensis, Rhizopus cohnii, Rhizopus japonicus, Rhizopus nodosus,  
Rhizopus delemar, Rhizopus acitorinus, Rhizopus chlamydosporus, Rhizopus  
circinans, Rhizopus javanicus, Rhizopus peka, Rhizopus saitoi, Rhizopus tritici,  
Rhizopus niveus, Rhizopus microsporus, Mitosporic fungi, *Aureobasidium* spp.,  
Acremonium spp., Cercospora spp., Epicoccum spp., *Monilia* spp., *Monilia*  
*candida*, *Monilia sitophila*, Mycoderma spp., Candida spp., Candida krusei,  
Candida edax, Candida etchellsii, Candida kefir, Candida krusei, Candida lactosa,  
Candida lambica, Candida melinii, Candida utilis, Candida milleri, Candida  
mycoderma, Candida parapsilosis, Candida obtux, Candida tropicalis, Candida  
valida, Candida virens, Candida guilliermondii, Rhodotorula spp., Torulopsis  
spp., Geotrichum spp., Geotrichum amycaleum, Geotrichum amillaria,  
Geotrichum asteroid s., Geotrichum bipunctatum, Geotrichum dulcicum,

Geotrichum eriense, Geotrichum fici, Geotrichum flavo-brunneum, Geotrichum fragrans, Geotrichum gracile, Geotrichum heritum, Geotrichum kiebaki, Geotrichum penicillatum, Geotrichum hirtum, Geotrichum pseudocandidum, Geotrichum rectangulatum, Geotrichum suaveolens, Geotrichum vanryiae, Geotrichum loubieri, Geotrichum microsporum, Cladosporium spp., Trichoderma spp., Trichoderma hamatum, Trichoderma harzianum, Trichoderma koningii, Trichoderma pseudokoningii, Trichoderma reesei, Trichoderma virgatum, Trichoderma viride, Oidium spp., Alternaria spp., Alternaria alternata, Alternaria tenuis, Helminthosporium spp., Helminthosporium gramineum, Helminthosporium sativum, Helminthosporium teres, Aspergillus spp., Aspergillus ochraceus, Aspergillus nidulans, Aspergillus versicolor, Aspergillus wentii Group, Aspergillus candidus, Aspergillus flavus, Aspergillus niger, Aspergillus oryzae strain ATCC 14156, Penicillium spp., Penicillium aculeatum, Penicillium citrinum, Penicillium claviforme, Penicillium funiculosum, Penicillium italicum, Penicillium lanoso-viride, Penicillium emersonii, Penicillium lilacinum, Penicillium expansum and mixtures thereof.

~~25. A malted cereal product made according to the process of claims 18, 19, 20, 21, 22, 23 or 24.~~

~~26. Use of activated spores in the preparation of a malted cereal.~~

*Sub B61*  
~~27. A process for the preparation of malted cereals, wherein the steeping step includes one or more wetting stages at a temperature between 5° and 30° C, preferably between 10° and 20° C, until the material has a moisture content between 20% and 60% by weight, preferably between 38% and 47%, wherein after a germination period between 2 and 7 days, preferably between 3 to 6 days at a temperature between 10° and 30° C, preferably between 14° and 18° C, the steeped and germinated cereals are preferably kilned by increasing~~

Sub B4

the temperature to values between 40° and 150° C until the material has a moisture content between 2% and 15% by weight, and wherein one or more microbial cultures selected from the group consisting of one or more bacteria and/or one or more fungi are added in one or more times either before or during or after the malting process of said cereals.

Sub C1

28. Process according to claim 27, for the preparation of malted barley, wherein the bacteria are selected from the group comprising *Micrococcus* spp., *Streptococcus* spp., *Leuconostoc* spp., *Pediococcus* spp. preferentially *Pediococcus halophilus*, *Pediococcus cerevisiae*, *Pediococcus damnosus*, *Pediococcus hemophilus*, *Pediococcus parvulus*, *Pediococcus soyae*, *Lactococcus* spp., *Lactobacillus* spp. preferentially *Lactobacillus acidophilus*, *Lactobacillus amylovorus*, *Lactobacillus bavanicus*, *Lactobacillus bifementans*, *Lactobacillus brevis* var *lindneri*, *Lactobacillus casei* var *casei*, *Lactobacillus delbrueckii*, *Lactobacillus delbrueckii* var *lactis*, *Lactobacillus delbrueckii* var *bulgaricus*, *Lactobacillus fermenti*, *Lactobacillus gasseri*, *Lactobacillus helveticus*, *Lactobacillus hilgardii*, *Lactobacillus renferii*, *Lactobacillus sake*, *Lactobacillus sativarius*, *Lactobacillus cremoris*, *Lactobacillus kefir*, *Lactobacillus pentoceticus*, *Lactobacillus cellobiosus*, *Lactobacillus bruxellensis*, *Lactobacillus buchneri*, *Lactobacillus coryneformis*, *Lactobacillus confusus*, *Lactobacillus florentinus*, *Lactobacillus viridescens*, *Corynebacterium* spp., *Propionibacterium* spp., *Bifidobacterium* spp., *Streptomyces* spp., *Bacillus* spp., *Sporolactobacillus* spp., *Acetobacter* spp., *Agrobacterium* spp., *Alcaligenes* spp., *Pseudomonas* spp. preferentially *Pseudomonas amylophilis*, *Pseudomonas aeruginosa*, *Pseudomonas cocovenenans*, *Pseudomonas mexicana*, *Pseudomonas pseudomallei*, *Gluconobacter* spp., *Enterobacter* spp., *Erwinia* spp., *Klebsiella* spp., and *Proteus* spp.

Claim B5

29. The process according to claim 27, for the preparation of malted barley wherein the fungi are selected from the group (genera as described by Ainsworth and Bisby's dictionary of the fungi, 8th edition, 1995, edited by D.L. Hawksworth, P.M. Kirk, B.C. Sutton, and D.N. Pegler (632 pp) Cab International) comprising Ascomycota preferentially Dothideales preferentially Mycosphaerellaceae preferentially Mycosphaerella spp., Venturiaceae preferentially Venturia spp.; Eurotiales preferentially Monascaceae preferentially Monascus spp., Trichocomaceae preferentially Emericilla spp., Euroteum spp., Eupenicillium spp., Neosartorya spp., Talaromyces spp.; Hypocreales preferentially Hypocreaceae preferentially Hypocrea spp.; Saccharomycetales preferentially Dipodascaceae preferentially Dipodascus spp., Galactomyces spp., Endomycetaceae preferentially Endomyces spp., Metschnikowiaceae preferentially Guilliermondella spp., Saccharomycetaceae preferentially Debaryomyces spp., Dekkera spp., Pichia spp., Kluyveromyces spp., Saccharomyces spp., Torulaspora spp., Zygosaccharomyces spp., Saccharomycodaceae preferentially Hanseniaspora spp.; Schizosaccharomycetales preferentially Schizosaccharomyces spp.; Sordariales preferentially Chaetomiaceae preferentially Chaetomium spp., Sordariaceae preferentially Neurospora spp.; Zygomycota preferentially Mucorales preferentially Mucoraceae preferentially Absidia spp., Amylomyces spp., Rhizomucor spp., Actinomucor spp., Thermomucor spp., Chlamydomucor spp., Mucor spp. preferentially Mucor circinelloides, Mucor griseicyanus, Mucor hiemalis, Mucor indicus, Mucor mucedo, Mucor piriformis, Mucor plumbeus, Mucor prainii, Mucor pusillus, Mucor sylvaticus, Mucor javanicus, Mucor racemosus, Mucor rouxianus, Mucor rouxi, Mucor aromaticus, Mucor flavus, Mucor micheei, Rhizopus spp. preferentially Rhizopus arrhizus, Rhizopus oligosporus, Rhizopus oryzae preferentially strains ATCC 4858, ATCC 9363, NRRL 1891, NRRL 1472, Rhizopus stolonifer, Rhizopus thailandensis, Rhizopus formosaensis, Rhizopus

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*chinensis*, *Rhizopus cohnii*, *Rhizopus japonicus*, *Rhizopus nodosus*, *Rhizopus delemar*, *Rhizopus stenorinus*, *Rhizopus chlamydosporus*, *Rhizopus circinans*, *Rhizopus javanicus*, *Rhizopus peka*, *Rhizopus saitoi*, *Rhizopus tritici*, *Rhizopus niveus*, *Rhizopus microsporus*; Mitosporic fungi preferentially *Aureobasidium* spp., *Acremonium* spp., *Cercospora* spp., *Epicoccum* spp., *Monilia* spp. preferentially *Monilia candida*, *Monilia sitophila*, *Mycoderma* spp., *Candida* spp. preferentially *Candida dildensiae*, *Candida edax*, *Candida etchellsii*, *Candida kefir*, *Candida krusei*, *Candida lactosa*, *Candida lambica*, *Candida melinii*, *Candida utilis*, *Candida milleri*, *Candida mycoderma*, *Candida parapsilosis*, *Candida obtusa*, *Candida tropicalis*, *Candida valida*, *Candida versatilis*, *Candida guilliermondii*, *Rhodotorula* spp., *Torulopsis* spp., *Geotrichum* spp. preferentially *Geotrichum amycelium*, *Geotrichum armillariae*, *Geotrichum asteroides*, *Geotrichum bipunctatum*, *Geotrichum dulcium*, *Geotrichum eriense*, *Geotrichum fici*, *Geotrichum flavo-brunneum*, *Geotrichum fragrans*, *Geotrichum gracile*, *Geotrichum heritum*, *Geotrichum klebaki*, *Geotrichum penicillatum*, *Geotrichum hirtum*, *Geotrichum pseudocandidum*, *Geotrichum rectangulatum*, *Geotrichum suaveolens*, *Geotrichum vanlyiae*, *Geotrichum loubieri*, *Geotrichum microsporum*, *Cladosporium* spp., *Trichoderma* spp. preferentially *Trichoderma hamatum*, *Trichoderma harzianum*, *Trichoderma koningii*, *Trichoderma pseudokoningii*, *Trichoderma reesei*, *Trichoderma viratum*, *Trichoderma viride*, *Oidium* spp., *Alternaria* spp. preferentially *Alternaria alternata*, *Alternaria tenuis*, *Helminthosporium* spp. preferentially *Helminthosporium gramineum*, *Helminthosporium sativum*, *Helminthosporium teres*, *Aspergillus* spp. as described by R.A. Samson ((1994) in Biotechnological handbooks, Volum 7:*Aspergillus*, edited by Smith, J.E. (273 pp), Plenum Press) preferentially *Aspergillus ochraceus* Group (Thom & Church), *Aspergillus nidulans* Group (Thom & Church), *Aspergillus versicolor* r Group (Thom & Church), *Aspergillus wentii* Group (Thom & Raper), *Aspergillus candidus* Group (Thom & Raper), *Aspergillus flavus* Group (Raper & Fennell), *Aspergillus niger* Group (Thom &

*Sub B5*

Church), *Penicillium* spp. preferentially *Penicillium aculeatum*, *Penicillium citrinum*, *Penicillium claviforme*, *Penicillium funiculosum*, *Penicillium italicum*, *Penicillium lanoso-viride*, *Penicillium emersonii*, *Penicillium lilacinum*, and *Penicillium expansum*.

*Sub C6*

30. The process according to claim 27 for the preparation of malted cereals other than malted barley wherein the bacteria are selected from the group comprising *Micrococcus* spp., *Streptococcus* spp., *Leuconostoc* spp., *Pediococcus* spp., *Lactococcus* spp., *Lactobacillus* spp., *Corynebacterium* spp., *Propionibacterium* spp., *Bifidobacterium* spp., *Streptomyces* spp., *Bacillus* spp., *Sporolactobacillus* spp., *Acetobacter* spp., *Agrobacterium* spp., *Alcaligenes* spp., *Pseudomonas* spp., *Gluconobacter* spp., *Enterobacter* spp., *Erwinia* spp., *Klebsiella* spp., and *Proteus* spp.

*Sub B6*

31. Process according to claim 27 for the preparation of malted cereals other than malted barley wherein the fungi are selected from the group comprising Ascomycota preferentially Dothideales preferentially Mycosphaerellaceae preferentially *Mycosphaerella* spp., Venturiaceae preferentially *Venturia* spp.; Eurotiales preferentially Monascaceae preferentially *Monascus* spp., Trichocomaceae preferentially *Emericilla* spp., Euhyphomycetes spp., *Eupenicillium* spp., *Neosartorya* spp., Talaromyces spp.; Hypocreales preferentially Hypocreaceae preferentially *Hypocrea* spp.; Saccharomycetales preferentially Dipodascaceae preferentially *Dipodascus* spp., Galactomyces spp., Endomycetaceae preferentially *Endomyces* spp., Metschnikowiales preferentially *Guilliermondella* spp., Saccharomycetaceae preferentially Debaryomyces spp., Dekkera spp., Pichia spp., Kluyveromyces spp., Saccharomyces spp., Torulaspora spp., preferentially Saccharomycodacea preferentially Schizosaccharomycetales preferentially Schizosaccharomycetaceae

sub b6

preferentially *Schizosaccharomyces* spp.; *Sordariales* preferentially *Chaetomiaceae* preferentially *Chaetomium* spp., *Sordariaceae* preferentially *Neurospora* spp.; *Zygomycota* preferentially *Mucorales* preferentially *Mucoraceae* preferentially *Absidia* spp., *Amylomyces* spp., *Rhizomucor* spp., *Actinomucor* spp., *Thermomucor* spp., *Chlamydomyces* spp., *Mucor* spp., *Rhizopus* spp.; Mitosporic fungi preferentially *Aureobasidium* spp., *Acremonium* spp., *Cerocystis* spp., *Epicoccum* spp., *Monilia* spp., *Mycoderma* spp., *Candida* spp., *Rhodotorula* spp., *Torulopsis* spp., *Geotrichum* spp., *Cladosporium* spp., *Trichoderma* spp., *Oidium* spp., *Alternaria* spp., *Helminthosporium* spp., *Aspergillus* spp., and *Penicillium* spp.

28, 29, 30 or

32. Process according to any of Claims 27 to 31, wherein the total time of submersion in water during steeping for physiological reasons does not exceed 30 hours, preferentially takes 10 to 25 hours, or wherein the kilning includes more than two temperature steps and wherein the microbial culture comprises *Rhizopus* spp. and/or *Pseudomonas* spp.

33. Process according to the claim 32, wherein the *Rhizopus* spp. is preferably a *Rhizopus oryzae* such as a *Rhizopus oryzae* strain ATCC 9363.

34. Process according to the claim 31 or claim 32, wherein the *Pseudomonas* sp. is preferably a *Pseudomonas herbicola*.

28, 29, 30, 31 or 33

35. Process according to any of claims 27 to 35, wherein the microbial spores used are activated by one or a combination of the following treatments:

- (a) cycles of wetting and/or drying,
- (b) addition of nutritional supplies or addition of spore elements,
- (c) exposure to temperature changes, preferably within a range of 0° to 80° C.

*Sub B b)*

(d) exposure to changes in pH, preferably within a pH range of 2.0 to 8.0, more preferably between 3.0 and 6.0, to obtain spores significantly more swollen than their dormant size, more particularly, the size of the spores is increased by a factor preferably between 1.2 and 10 over their dormant size and/or spores with one or more germ tubes per spore.

*, 28, 29, 30, 31 or 33*

36. Process according to any one of claims 27 to 35, wherein the pH during the steeping step is adjusted to a value between 4.0 and 6.0.

*, 28, 29, 30, 31 or 33*

37. Process according to any one of claims 27 to 36, wherein nutrients and/or additives are added prior to and/or during the malting process.

38. Malted barley characterized by a  $\beta$ -glucanase activity increased by at least a factor 4 and a xylanase activity increased by at least a factor of 4, compared to the conventional malting process of any available barley.

39. Malted barley, wherein the  $\beta$ -glucanase activity is higher than 700 units/kg. and the xylanase activity is higher than 250 units/kg.

40. Malted barley according to claim 38 or 39 obtained by the process of any one of the claims 27 to 37.

41. Malted barley according to any one of claims 38 to 40, characterized in that they present an improved modification and/or an increased hydrolytic enzyme activity, a decreased level of toxins and/or increased microbial safety or increased acceptability.

*or 39*

~~42. Use of the malted cereals according to any one of the claims 38 to 41, or obtained by the process of any one of the claims 27 to 37 for the preparation of beverages.~~

add c8  
add c9